

# LETTERS

## Evolving dialogs

An unusually large amount of mail was received about a News & Comment article on education and evolution, including provocative letters about scientific theory, "critical analysis," and the cost of not entering the debate (right, the 1925 Scopes trial). Elsewhere, an author offers to answer charges of anti-Semitism against him that he says are "wrong," but "understandable." One researcher recounts his experience of losing financial support from the Council for Tobacco Research. And analyses of the Chernobyl nuclear power accident are discussed.



## Teaching Evolution

In the News & Comment article "Creationists evolve new strategy" by Karen Schmidt (26 July, p. 420), there is reference to the theory of evolution being "fact." As a scientist, my understanding of the scientific method is that one proposes a hypothesis for a given set of observations. Facts are gathered and if the facts support the hypothesis, then it becomes a theory. The facts concerning evolution are the fossils and artifacts painstakingly found over the years. Evolution is the theory developed to explain these facts.

The next step is to continually test the theory. If it proves true in all circumstances, then it becomes a law. There is a Law of Gravity and the Laws of Thermodynamics, but there is not a Law of Evolution of which I am aware. Yet the schools teach evolution as if it is a law, not as the theory it truly is. By teaching evolution in this manner, schools do not convey all the exciting aspects of the evolutionary theory.

While I would not want creationism to be taught in a science classroom, I believe that the current methods for teaching the theory of evolution need to be reexamined and allowed to "evolve" into a more scientific approach to this very emotional topic.

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Schmidt reports that the anti-evolution movement's "shrewd new strategy" asks schools "to present evolution as theory, not fact." The tenor of those opposed to this

request is that evolution should be presented as fact, and whatever scientific evidence there may be against evolution should not be presented. I disagree. Theories are conceptual frameworks for organizing facts and putative facts. Theories allow prediction of results of proposed experiments. Theories may be so successful that practitioners come to believe in them.

In terms of education, critical analysis is the critical issue. The educational process should explore what scientists mean by evidence and how observations of consistent patterns lead to powerful ways of thinking about the world. The high ground is the concept, fundamental to the scientific method, that no organizing principle is immune to challenge and that progress comes from careful questioning and continuing reassessment of both old and new evidence. If these ideas can be communicated, kids will be able to see for themselves that "creation science" isn't science at all.

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Schmidt's examination of the new creationism is welcome and overdue. It is not only the rise of creationist-inspired school textbook-censorship and legislation that threatens science: the newer forms of anti-science—such as "intelligent design theory"—are making progress on college campuses, as those of us who teach undergraduates know all too well.

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The "facts" offered by opponents of evolutionary science are indeed a danger, because they are not facts—radiometric dating grossly in error, no fossil forms intermediate between existing species, "Darwinism" not accounting for complexity, the Grand Canyon formed in the Noachian flood, the Paluxy River "footprints," and the like. And as one commentator has observed, creationists *can* tell more lies in "debate" than an honest disputant can skewer. Nevertheless, the advice given by Eugenie Scott of the National Center for Science Education—that individual scientists should probably not enter debates—is self-defeating. If not scientists, then who? The claim that to enter such debates is demeaning, or is a lost cause, or might harden the opposition, is an invitation to quietism. It is the same advice as that given, for too long, to opponents of animal rights extremism. It is bad advice.

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The oxymoron of "creation science" is as farcical as are the terms "abrupt appearance theory." It is distressing that creationists' bills use tactics to intimidate teachers and their job security to the point that evolu-

tion is not taught, or worse that the teachings provide misinformation. It is also unfortunate that creationists continue to prey on the young and ignorant.

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### Charges of Anti-Semitism

Constance Holden's article "Publisher draws censorship charge" (News, 12 July, p. 177) is a concise and accurate synopsis of a protracted and nasty series of events. Although charges of anti-Semitism against me are wrong, they are also understandable. My review (1) of Kevin MacDonald's excellent book, *A People That Shall Dwell Alone: Judaism as a Group Evolutionary Strategy* (2), made unrealistic assumptions about readers' familiarity with issues at hand, and so drew conclusions based on inadequately supplied information.

Unfortunately, one way to make charges of anti-Semitism stick is to publish a submission that draws such charges, then refuse to publish a rejoinder (3) that apologizes for shortcomings, attempts to clarify misunderstandings, and refers readers to ad hoc sources of relevant information (4). Five

editorial board members of *Ethology and Sociobiology* judged my rejoinder to be such a submission, but the journal's publisher, Elsevier Inc., still refuses to publish it.

I ask interested readers to withhold judgment until they have a fuller explanation of my views—which can be obtained (including a copy of the accepted-but-censored addendum) by forwarding an address label to the address below.

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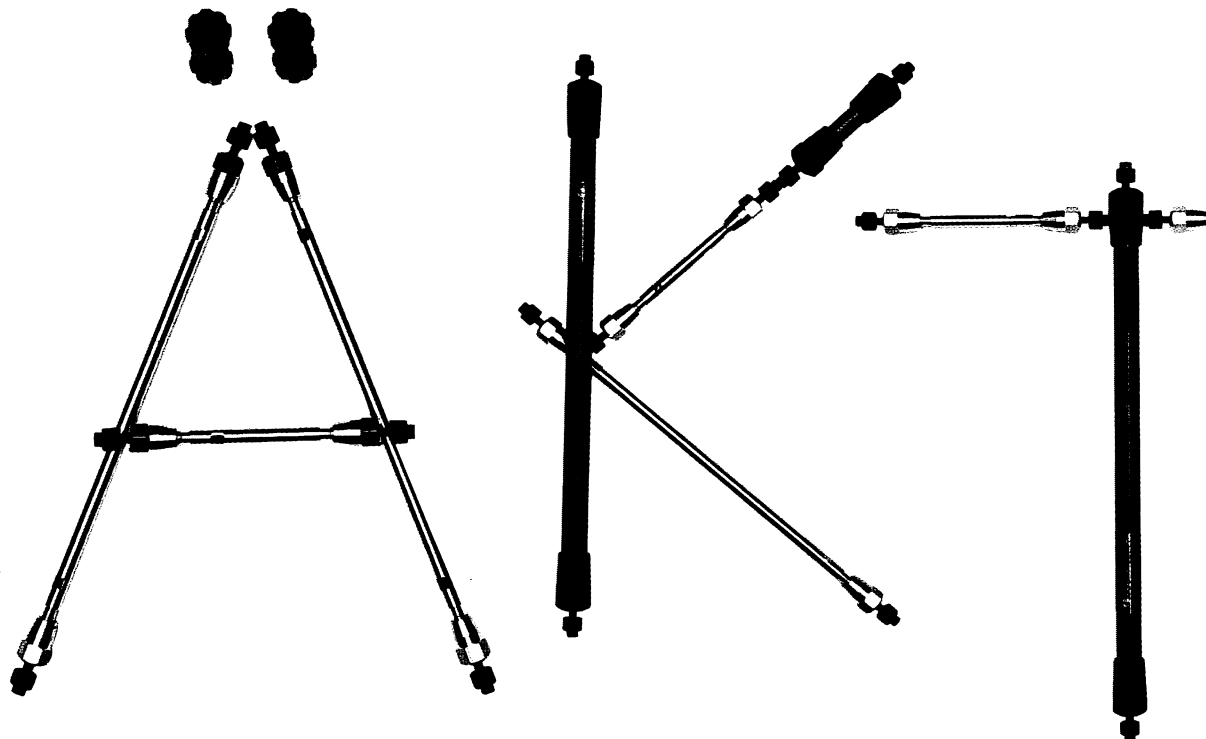
### References

1. J. Hartung, *Ethol. Sociobiol.* **16**, 335 (1995).
2. K. MacDonald, *A People That Shall Dwell Alone: Judaism as a Group Evolutionary Strategy* [Praeger (Greenwood), Westport, CT, 1994].
3. ———, in preparation.
4. ———, *Skeptic* **3**, 86 (1995); *ibid.* **4**, 24 (1996); *ibid.*, p. 62.

### Tobacco Research: One Researcher's Experience

James F. Glenn's statement (Letters, 12 July, p. 167) that "CTR [the Council for Tobacco Research] has always encouraged

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